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Employees' Perceptions of Cycle Commuting: A Qualitative Study

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Manuscripts

Review

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Abstract

Purpose - This study aimed to gain an in-depth individual level understanding of the psychological factors that affect cycle commuting.

Design/methodology/approach - A total of 15 participants (eight cycle commuters and seven potential cycle commuters) from a ‘cycle friendly’ employer based in a Scottish city took part in the study. Semi-structured interviews and Interpretative Phenomenological Analysis (IPA) were used to collect and analyse data.

Findings - The present study found that cyclists are more aware of the benefits of cycle commuting than potential cyclists. Those who did not currently cycle to work displayed a heightened awareness of the challenges of cycling to work, whereas cyclists reported more coping strategies for negotiating or overcoming the challenges involved in cycle commuting. These individual cognitions are potentially modifiable through psychological interventions.

Research limitations/implications - Future research should be carried out on samples in different contexts to examine whether some of the findings would be supported in other populations.

Practical applications - The findings from this paper suggest that psychological interventions based on challenging perceptions of the benefits and barriers to cycling may have a valuable role to play in enhancing cycle commuting rates.

Originality/value - This study uses IPA to explore the complexities of perceptions in relation to cycle commuting. It also brings to light, the types of coping strategies used to enable cyclists to overcome some of their challenges associated with cycle commuting.

Introduction

Physical inactivity poses a major public health challenge in western societies (Department of Health, 2004). Presently in Scotland, 67% of women and 55% of men are not meeting the current recommendations of 30 minutes of moderate exercise on most days of the week, with inactivity accounting for over a third of deaths from heart disease (Scottish Government, 2009).

On a national level cycling in Scotland has been receiving heightened attention due to its potential to improve public health (Cavill and Watkins, 2007; Cavill and Davis, 2007; Wardman *et al.*, 2007). Cycling is a sustainable, healthy, transport option that can improve physical and psychological health and decrease carbon emissions (Cavill and Davis, 2007). Cycle commuting fits into daily life and provides the working population with an opportunity to be physically active (Vuori *et al.*, 1994) and travelling through green space promotes self-esteem and enhances mood (Barton and Pretty, 2010). Although there is some debate surrounding the associated dangers of cycling, Hillman (1993) has suggested that the benefits outweigh the risks by 20 to one. More recently, de Hartog *et al.* (2010) reported more modest findings that the benefits of cycling are seven

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times larger than the risk involved in the UK context. Furthermore, the risks of road traffic accidents among cyclists, although higher than car users are lower than for pedestrians (Cavill and Davis, 2007).

Despite the benefits of cycling, only a small sector of the population cycle to work. Currently around 2% of people in Scotland cycle commute (Scottish Executive, 2009), which reflects UK figures of cycling for transport (Department for Transport, 2008). Studies in the UK have found that over 85% of respondents would be interested in cycling more often (Scottish Executive, 2009; Department for Transport, 2002).

Environmental factors such as danger from motor traffic, poor infrastructure and bad weather are commonly cited as key challenges deterring people from cycling (Crawford *et al.*, 2001; Scottish Executive 2009; Unwin, 1992). A recent UK study suggested that the environmental context has an important role to play in people’s choice to cycle or not (Cavill and Watkins, 2007). However, providing a supportive physical environment alone is insufficient to increase cycling (Giles-Corti and Donovan, 2002; Wardman *et al.*, 2007). To effectively promote cycling coordinated action is needed that addresses individual and social change, organisational change and environmental measures (Davies *et al.*, 1997; Giles-Corti *et al.*, 2005). The complex task of understanding cycling behaviour is also dependent on the journey type (Anable and Gatersleben, 2005).

Some people regularly cycle to work despite environmental challenges. A Belgian study found individual factors had a stronger influence on cycle commuting behaviour than environmental ones (de Geus *et al.*, 2008). Research addressing individual factors (e.g. perceptions, attitudes and beliefs) is therefore crucial to understanding uptake of

cycling and is also of value because individual factors are frequently more modifiable than environmental ones. Several questionnaire studies have addressed psychological factors related to cycling such as motivations and barriers (Crawford *et al.*, 2001; Anable and Gatersleben, 2005; Shannon, *et al.*, 2006; Gatersleben and Appleton, 2007). However these quantitative surveys may overlook some of issues that are of importance in determining cycling behaviour and qualitative exploratory research that focuses on individual perceptions and experiences is sparse (Cavill and Watkins, 2007; Davies *et al.*, 1997; McKenna and Whatling, 2007).

A range of intervention approaches to increase rates of commute cycling have been developed and piloted. These include hard measures, such as infrastructure changes within the workplace and the wider environment, and softer measures such as incentives, social marketing techniques and psychological techniques (e.g. Cleary and McClintock, 2000; Mutrie *et al.*, 2002; Wen *et al.*, 2005; Gatersleben and Appleton, 2007). Sloman *et al.* (2009) found that a combination of hard and soft intervention approaches in six demonstration towns in the UK has led to an 27% increase in cycling over a three-year period.

There are very few published psychological intervention studies that have aimed to increase cycle commuting. One such study, based on the transtheoretical model of behaviour change (Prochaska and DiClemente, 1982), tailored its intervention to employees in the contemplation and preparation stages of cycling and walking to work (Mutrie *et al.*, 2002). The intervention achieved success for walking but not for cycling. The study concluded that it is more difficult for cyclists to overcome environmental and workplace barriers than it is for walkers. Follow-up qualitative research found that

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although many people perceived similar environmental barriers, the individuals who were successful at walking and cycling developed coping strategies to overcome their own perceived barriers (Crawford *et al.*, 2000; Mutrie *et al.*, 2002). Further research on psychological approaches will add to the momentum of success achieved in promoting cycling by explaining how individual variables interact with other factors to predict cycling.

McKenna and Whatling (2007) suggest that more in-depth qualitative research that focuses on the individual may offer a fresh view on how to support and encourage cycle commuting. Their findings reveal a range of perceptions of barriers and motivations for commute cycling. Uniquely their work also highlights the power relations between the dominance of car users and the marginalisation of cyclists on the roads.

The aim of the present study is to explore people’s perceptions and lived experiences of cycle commuting and the influences that underlie their decision of whether to cycle to work or not. The research focus is on discerning a greater understanding of commonalities and differences of opinion regarding cycle commuting between a group of cycle commuters (CC) and a group of potential cycle commuters (PCC) who are interested in the idea of cycling to work. This work is original in a number of respects. Firstly, this study adopts a qualitative methodological approach to a field that is largely explored using quantitative surveys and interventions. Secondly, the focus purely on people’s perceptions and experiences of cycle commuting allows the opportunity to explore the complexities of this behaviour. Thirdly, the qualitative nature of the study facilitates closer consideration of the impact of context on cycle commuting.

Method

This research used semi-structured interviews alongside interpretative phenomenological analysis (IPA) to gain a more ideographic and detailed examination of participants' lived experiences with regard to cycle commuting (Smith and Osborn, 2003). IPA is an increasingly popular form of qualitative analysis (Reid *et al.*, 2005). The strength of IPA is the concern with individuals' subjective perceptions of a topic, referred to as the 'insider perspective' as opposed to trying to produce objective statements (Smith *et al.*, 1999).

In IPA the emphasis is placed on both the researcher's commitment to gain an in-depth understanding into the participant's world whilst also taking a step back and trying to learn something common about the group (Smith and Eatough, 2007). It is acknowledged that participants' thoughts are not always immediately visible from their accounts as they try to make sense of their world. Rather, by engaging in an analytical process the researcher can cautiously interpret a participants cognitions (Smith *et al.*, 1999).

Participants

A purposive sample of 15 participants took part in the study. All participants were employees of a workplace based in central Edinburgh, UK. The workplace held a Cycle Friendly Employer Certificate for providing good cycle facilities and support. These included, introduced or improved: showers and changing rooms; and storage space and cycle parking facilities. The company also offered financial incentives for cycling (e.g. mileage allowances and discount schemes) and social support (e.g. promotional events). It

was anticipated that using a centrally based, cycle friendly employer would reduce organisational and environmental barriers to cycling and therefore facilitate a clearer understanding of the psychological factors that affect cycle commuting.

Participants were selected on the basis of fulfilling the criteria of being either regular cycle commuters (n=8) or potential cycle commuters (n=7). Potential cycle commuters stated an interest in cycle commuting and were contemplating the idea of cycling to work. Potential cycle commuters were chosen as opposed to all non-cycle commuters because interventions to increase cycle commuting are more likely to be successful if focused on this group. Four women and 11 men took part, aged from 21 to 65 (see Tables 1 and 2). The daily commute made to work by CC participants ranged from two to nine miles. The PCC participants commuting journeys ranged from two to 16 miles. However, those travelling longer distances planned to cycle only a part of their commuting journey. The CC participants' routes varied widely in terms of the actual paths and roads they take, as well as the surrounding landscape. Some journeys primarily consisted of quiet off-road cycle paths, green space and countryside. In contrast, others cycled their entire journey on busy main roads, using shared cycle lanes, advisory on-road cycle lanes and, in some instances, no designated cycle lanes.

Insert Tables 1 and 2 here.

Interviews

Semi-structured interviews were used which lasted between 30 minutes and one hour. A flexible interview guide was designed whereby questions could be ordered differently and

novel areas could be explored if deemed helpful in addressing the research aims (Bryman, 2004). A similar interview schedule was developed for the two groups with small modifications to attend to their different behaviours. The questions were designed to identify the individual perceptions of personal, organisational and environmental factors relating to cycle commuting. A list of follow-up questions and facilitative comments were developed in advance and were non-leading to encourage further elaboration of answers.

In an attempt to enhance the commitment to the participant's perspective the interviewer used the principle of bracketing, to identify and make explicit her own opinions and assumptions to encourage self-reflexivity (Langdridge, 2007). Emphasis was given to the participant's accounts and areas deemed important and salient to the participant's world. Each interview was audio-recorded and supplemented by filed notes of the interviewer's interpretations (Kvale, 2007).

Analysis

All interviews were transcribed word-for-word with pseudonyms assigned to each participant. Analysis guidelines were followed (Smith and Osborn, 2003) to ensure that a thorough analysis was carried out whilst paying attention to the original aims of the investigation. Throughout the transcription and analysis process a research journal was kept to document the researcher's ideas about tentative relationships and emerging themes within and between data sets. The CC and PCC groups were initially analyzed separately to facilitate a more idiographic and nuanced analysis. Emerging themes from the initial notes were written in the right hand margin allowing for theoretical connections

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whilst still grounded in the specifics of the accounts. The transcripts were then re-read, with a more critical focus. Through carrying out this process some small changes were made to the existing interpretations. The transcripts were then uploaded into NVivo, a qualitative software package, and analysis entailed clustering the emerging themes into overarching themes across the two participant groups systematically.

Care was taken to keep interpretations as close as possible to the data and not to over-interpret. This was achieved through an analytical audit was carried out on six transcripts by all three authors. There was a high degree of concordance in the emergent themes and the few divergences were resolved through discussion.

Findings

Nine themes emerged from the interviews. These themes encompass beneficial, challenging and facilitating aspects of cycle commuting behaviour. The analysis attempts to strike a balance between the emic (insider perspective of the participant) and the etic (researcher’s interpretation) by doing justice to the individual as well as emerging commonalities within the group (Reid *et al.*, 2005). Within the themes commonalities and differences between the two groups are described.

Health and Wellbeing

All CC and PCC participants discussed how cycle commuting contributes to general health and wellbeing. Each individual spoke about the physical activity aspect of cycle commuting (e.g. aerobic fitness and weight management). For many this was a key contributing reason for cycling to work. Additionally, several participants highlighted

that cycling to work was a convenient opportunity to exercise in an otherwise busy day.

One of the cycle commuters, Carl, stated:

From a point of view of cycling, it fits in to the extent of, for me, it's just dead time.

... it's half an hour twice a day that I do it and that's just my exercise done...

whereas otherwise because of the family side of things, I don't have that time.

Whilst most of the CC participants highlighted the psychological wellbeing they experienced from their cycle journeys, this was rarely discussed by the PCC group. Only Dawn and Grant in the PCC group, who had previously cycle commuted, spoke in any detail about the psychological benefits of cycling. Most CC participants discussed how cycle commuting can 'clear your head', 'provide thinking time', 'help you to de-stress and unwind', and 'make you feel better'. Fred, who cycle commutes through mixed terrain said:

It means that on most days here [at the workplace] and at home I'm probably in a reasonably positive frame of mind... I have the unwinding space on the way home and the contemplative space on the way in, which gives some balance and order, if you like, to my day... I wouldn't get this coming to work any other way.

Most of the CC participants spoke of how they also cycled for leisure. When discussing the advantages of cycle commuting, some PCC participants showed awareness of the impact cycle commuting may have on increasing their recreational cycling. For

example, Amy stated: “I think if I cycled more regularly into work we’d probably increase what we did as a family”. Euan and Felix (PCCs) thought that if they purchased a bike for the purpose of commuting they would also use it to cycle at the weekend with family and friends.

Time and Cost

Everyone in the CC group said that cycling to work either saved them time or took a similar amount of time to alternative forms of transport. CC participants living nearer to the city centre acknowledged that ‘door to door’ cycling was by far the quickest and most reliable means of transport, especially during rush hour. Carl stated: “I can’t take the bus trip any more. Sometimes it’s double the amount of time it takes for me on a bike”. By contrast, the view that cycling to work would save time was opposed by all, except one, of the PCC participants. Although some of the PCC participants provided a detailed estimate of the time their cycle journey would take them, Amy, Belle and Harry all thought that cycling would take longer than their current commute. Grant spoke of the more pleasant cycling route to work taking longer and therefore being “less appealing”.

Over half of the CC group mentioned that cycling into work saves money in terms of bus fares, car parking, petrol, and the costs of owning and maintaining a car. Bert, who has cycled for many years and doesn’t own a car, found there to be a significant cost saving involved. Whilst recognising costs associated with cycling, Carl took a long-term view that cycling was a financially viable option: “So its £1.10 per single on the bus every time I go... with all my gear and bike it was around about £500 I think to buy everything, so, couple of years, so that’s, it’s paid for itself”. In comparison, only two of

the PCC group thought that cycling would save them money and one PCC participant mentioned that the expense of purchasing a bike was a deterring factor.

Enjoying the Cycling Experience

All CC participants positively discussed aspects of being outdoors. For many, travelling by bike provided the opportunity to get some fresh air, although some questioned the freshness of the air in the city centre. Fred, who cycles part of his route through the countryside said:

There's something about being out in the open air and it doesn't really matter whether it's raining or windy or sunny or a combination of those things. ... it's something about a sense that you're enjoying, how would I best describe it, you enjoy the natural world... You're actually really feeling, you feel the sun, you feel the rain, let's say you enjoy the flowers, you smell the flowers and so on. ... It's being out and in touch with the elements of the world.

In contrast, only Grant and Dawn from the PCC group, both with previous cycle commuting experience, spoke positively about enjoying being outdoors on their bikes. The other PCC participants did not speak in any detail about enjoying cycling.

Socially Responsible Behaviour

Both CC and PCC participants, who mentioned having young children, felt it was important to be healthy role models for them. Amy, a potential cycle commuter, stated:

“I’d like my son to see that cycling was a viable choice of transport. He’s too ready to jump into the car at every opportunity”. Some CC and PCC participants mentioned environmentally friendly aspects of cycling into work, but this seemed a peripheral benefit. Fred, one of the cycle commuters said: “I am able to feel that I am doing something towards the environment”.

Work and the Workplace

Many CC and PCC participants had to travel regularly within their work role and discussed the difficulty of cycling to work on these days. Carl, who cycled into work three days per week on average, said: “I work in Aberdeen a day; I’ll be through in Glasgow, up and down to London so it’s quite difficult to sort of work that all out”. Working in different locations could also hinder cycle commuting the day before travelling as it was sometimes necessary to take large files and equipment home on the evening beforehand.

Within the CC group, those who carried their belongings in a backpack were more likely to view carrying their laptop as a barrier, whereas those who used panniers saw this as no problem. Of those in the PCC group who owned a bike, none of them used pannier bags and felt that carrying a laptop would create a barrier to cycling. Grant said:

On some occasions I wouldn’t have the option of leaving the laptop here [at the workplace] because I have some work at home... but I’m not going to carry six, seven, eight kilos on a back pack, do that as well as cycling up hill and over the cobbles. No, there’s just no way that’s going to happen.

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6 The company dress code required participants to wear smart clothes. Most of the
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8 CC participants cycled to work in casual clothes and then got changed into their work
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10 attire. Getting their clothes to the office and getting changed was seen as a challenge for
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12 some. Dan stated:
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17 It's a hassle trying to get all of your stuff in the same place, because it's important in
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19 what we do to have a nice suit and be well presented so that's kind of hard work
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21 sometimes, and then, how do you get your shirts to and from work?
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27 Their workplace had many cycle facilities including showers, secure and sheltered cycle
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29 parking, lockers and changing facilities. These facilities were commonly discussed in
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31 positive terms. However, some participants commented on difficulties in accessing the
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33 cycle parking and one CC participant mentioned that on occasion there were queues for
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35 the showers.
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39 The two PCC participants who did not own bikes were the least aware of the
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41 facilities the workplace had to offer. Euan wasn't sure if there were any showers and was
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43 concerned about arriving "all sweaty" at his work station. Although the workplace had
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45 two showers available for employees to use, Felix thought there was only one shower and
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47 he was concerned about queuing, which deterred him from cycling to work.
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51 Both groups considered that suitable workplace cycle facilities an essential pre-
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53 requisite for cycle commuting and generally viewed their workplace facilities positively.
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55 Amy, one of the potential cycle commuters said: "The firm's made it as easy as possible
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if you want to come in on a bike. There’s the storage and the showers and the lockers and so there’s no disadvantage”.

Another positive factor discussed by both groups was social support. Their workplace had a strong pro-cycling ethos and an active cycle community as well as a senior figure seen as a ‘cycle champion’ who offered support and advice to colleagues. Carl, who had recently started cycle commuting, talked about the impact that their cycle champion had on him:

He has been really good at promoting it generally. And I guess it’s just been chipping away at my collective thoughts for quite a while ... that I kind of know it’s something that I should really try and do.

Additional forms of workplace support for cycling such as staff discounts at a local cycle shop, tax relief payment schemes for purchasing bikes, cycle training courses and cycling breakfasts were also discussed positively.

Roads and Paths

The overall view was that cyclists are vulnerable on the roads, though individuals varied widely with regard to how they personally felt about cycling there. Individuals from both groups who had more experience of cycling on the roads generally perceived them to be safer than those with less experience. Within the CC group, Andrew and Carl, who had the least exposure to busy roads during their commute, both commented on their anxieties. Carl said that: “If I had to cycle on the actual ‘road’ roads all the time then that would

really put me off". In contrast, Helen, who travelled all of her journey to work on busy main routes, felt comfortable cycling on the roads:

It isn't dangerous, cycling in town, I'm sure there are more accidents with cars than there are with cyclists and things. I guess the other hurdle to get over is the fact that if a cyclist does have an accident then it can be very serious.

Some of the road infrastructure was viewed negatively by both the PCC and CC group participants. The CC group acknowledged that the city roads varied in the quality and quantity of cycling provision available. Certain areas were considered as dangerous and challenging for inexperienced cyclists. Ed stated:

I'm OK nowadays, but if you weren't a regular cyclist I think a lot of people would get quite scared to go on the roads. When you've got buses this close to you... some of it is just dangerous.

PCC participants mainly mentioned the lack of separate cycle lanes on the roads. They discussed infrastructure issues in relation to the current routes they travelled on, which all seemed to be via busy main roads. These would not necessarily be the only routes available to them if they were to cycle to work. Felix felt deterred from cycling due to the busy main roads but later mentioned that there may be alternative cycle friendly routes for him to travel on.

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Over half of the CC group felt that cyclists were not respected enough by other road users. Bert spoke of drivers not giving enough road space to cyclists: “The worst sorts are not giving clearance and ... cutting in when the driver is not allowed, not being aware that a cyclist actually has got forward motion”. Some PCC participants’ concerns also related to other road users’ attitudes. Amy, Dawn and Belle spoke of their experiences of seeing cyclists interact with traffic from a bus or a car’s perspective. Amy said:

Having been a bus user, having seen a lot of times how little respect is paid to cyclists, how close buses get to them ... how easy it is not to see a cyclist coming up the side of a bus. You know I’d just be very conscious, unconfident in both my behaviour in those circumstances and the other drivers’ behaviour.

Although busy main roads were viewed by some as challenging, off-road cycle paths and shared bus and cycle lanes were discussed positively by the CC group. In particular, the off-road cycle routes were seen as facilitating pleasant cycling experiences. This view was shared by two of the PCC participants, Grant and Dawn, who had previously cycle commuted. Andrew (CC) stated:

I’m lucky with the route, and that is a big driver for me in terms of the cycling I do... You’re cycling through forest effectively, by water so it’s, it’s a really nice place to be, it’s relaxing.

Over half of the PCC participants reported that if there was a more cycle-friendly route or path that they could use, they would be more encouraged to cycle commute.

Bad Weather

Some of the PCC group were deterred from cycle commuting by inclement weather regardless of the workplace facilities such as showers and changing rooms. They voiced their dislike of being outside in poor weather condition. However, many of the CC group along with Dawn, a PCC participant with cycle commuting experience, highlighted that inclement weather conditions did not normally affect their decision to cycle. It was only more extreme weather conditions such as ice and snow that prevented them from cycling into work. Discussing inclement weather, Greg (CC) said: “That doesn’t usually bother me too much either because unless it’s really bad, we have all the facilities we need here”.

Personal Challenges

The PCC group spoke about a variety of personal factors that they perceived as challenges when considering cycle commuting. In contrast, only self-motivation was discussed as a personal challenge by some of the CC group. PCC participants seemed less aware of the strategies that the CC group employed to overcome the daily challenges of cycling and perhaps consequently the PCC group seemed more concerned about these challenges.

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The three PCC commuters with young children all spoke of the challenges of the school run. Amy and Belle felt that cycling into work may not be a feasible option until their children were slightly older:

When you’ve got family and kids and it’s just, your time is not really your own time you know to really make a choice and go for it... if I had to cycle I would probably leave a lot earlier you know, which wouldn’t be too good for him (her son) ... But he’s getting older so you never know, once they do their own thing and you’ve got your time you’ve got more choices.

Dawn and Felix (PCCs) perceived difficulties with bike storage and security. Both participants lived in flats within the city centre area. Living in a top-floor flat, Dawn spoke of the challenge she would face, having to carry her bike up and down the stairs each day. Felix, who did not own a bike, had nowhere to store one and would not like to leave a bike outside in the street.

It was interpreted that in some cases, PCC participants’ lack of awareness of cycling and cycle facilities acted as a barrier to commute cycling. For instance, Felix, who discussed being deterred by busy roads, spoke of his general lack of awareness about cycling:

I don’t really pay attention to what cycling facilities there are. In terms of bike lanes and things like that, I just see kind of what’s beside me or if I see people cycling and

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3 getting cut up by buses and I know that the bus lanes and cycle lanes are right beside
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5 each other. But other than that I don't really pay attention so there might be more out
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7 there that I'm not aware of.
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12 In terms of initiating cycle commuting, two PCC participants, Dawn and Euan,
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14 both felt that lack of self-motivation played a detrimental role. Dawn said: "I think there's
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16 an element of just laziness". Harry spoke in similar terms about discipline: "So you
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18 know, it probably is more just a case of kind of personally making that commitment and
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20 getting on and doing it". Some CC participants also discussed the motivational challenges
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22 they faced when working late, very tired, or if the weather was particularly inclement.
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24 However, it was only on rare occasions that CC participants' lack of motivation stopped
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26 them from cycling. Andrew spoke of the kind of things that de-motivated him:
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34 At the end of the day or if you're running late or whatever it's just thinking 'right,
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36 I've just got to get on this bike now and cycle for the next hour' but generally once
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38 you get going it's fine. But sometimes you had a hard day here and you've got to
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40 cart stuff with you... sometimes you're a bit like 'can I really be bothered?'
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46 Although many challenges were discussed by the PCC participants, it was commented on
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48 by some of the PCC group that each individual challenge, and many environmental ones,
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50 did not make cycle commuting impossible rather, as a collective, these challenges did not
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52 make it an easy or straightforward option. Harry said: "I think there are a number of
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54 factors in there but none of those are insurmountable".
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Coping Strategies

To negotiate some of the challenging factors involved in cycle commuting, all CC participants had developed a range of personal coping strategies, to help them to fit cycling more easily into their daily lives. Planning and preparation were crucial in initiating and maintaining cycle commuting behaviour. The CC group and one PCC participant with previous experience of cycle commuting discussed the importance of developing a routine. They mentioned strategies such as: preparing the night before, planning which days of the week you are going to cycle into work in advance, obtaining the correct outdoor wear and cycle equipment and keeping clothes at the office.

Helen, one of the CC participants spoke about how she negotiates the school run. In her case, she was able to find ways of integrating the school run into her cycle commute by purchasing child seats for her bike and later buying her children their own bikes and cycling with them. When Greg (CC) felt unmotivated to cycle he reminded himself of the enjoyment he experienced from being outdoors. Similarly, Andrew (CC) overcame his lack of motivation for cycling by reminding himself of the limitations of his alternative journey:

I could go and stand and wait for a bus for ten minutes. Then I'm going to be shoe-horned onto that and then, by the time I get to the other end I've got to walk up the hill anyway so, I might as well just cycle and I get home about the same time.

To minimise the risks of cycling on the roads, there was a strong consensus that cyclists need a high awareness level to counteract the low visibility cyclists have on the roads and the dangers posed by other traffic. Bert (CC) elaborated on the importance of developing what he termed 'road craft' to minimise the risks of cycling:

I'm thinking not only of what's coming in front of me, but also people who may suddenly do a U turn in front of me or somebody coming from behind me that wants to cut me up... you've got to have a rubber neck, make sure you have eye contact with drivers at junctions... the key points are that other drivers are aware where you are and what your intention is.

Helen (CC) spoke about the strategies she employs to manage the traffic around her:

You need to be assertive and demonstrate what your intentions are, make sure it's clear and carry those through, that's the way to control traffic I think. It's a lot safer if you can do that. I think it's having confidence.

In terms of initiating cycle commuting, some individuals from both the CC and PCC group spoke of preparatory plans and ideas that could be employed to overcome some of the initial hurdles and uncertainties related to starting to cycle. Plans and ideas were discussed such as: having a practice run by bike to work out a suitable route and how long it would take, investing in a suitable bike, panniers and clothing, seeking

information from colleagues who cycled and from the internet, and going on a cycle training course to help build confidence to cycle in traffic.

Discussion

This study provides original insights into cycle commuting by qualitatively investigating both potential and regular cycle commuters’ perceptions and experiences of cycling to work alongside exploring the impact of the context in which the research is set. A synthesis of findings indicates that potential cyclists are less aware of the range of benefits associated with cycling to work than regular and experienced cycle commuters. Potential and regular cycle commuters’ accounts also differed in the way they discussed personal coping strategies, perceptions of supportive workplace facilities and perceptions of cycling infrastructure within the local environment. Cycle commuters discussed fewer challenges and more coping strategies than potential cycle commuters, who generally spoke more about challenges and less about coping strategies.

This study also brings to light the complex nature of cycle commuting and the high level of effort needed to take part in this behaviour. Even in a supportive workplace context, numerous psychological and perceptual factors can still pose as challenges to cycle commuting. In sum, the findings show that whilst cycling to work is a complex and effortful behaviour choice, cycle commuters are more able to favourably adapt their social cognitions towards cycling by either offsetting the challenges against the benefits they experience or by finding effective ways to cope with the challenges they encounter.

Being Aware of the Benefits

As with previous studies, physical health benefits and the convenience of exercising as part of your daily routine were viewed by both groups as motivating factors (Crawford *et al.*, 2001; Unwin, 1995). The CC and PCC participants' views differed the most in relation to cycle journey times. Whilst the CC group viewed the journey time as being quicker or the same as other transport modes, the majority of the PCC group felt that cycling would extend their journey time. Previous research has suggested that non-cycle commuters may inaccurately estimate the time that their cycle journeys would take (de Geus *et al.*, 2008). Although this may not always be the case, when promoting cycling, it would be valuable to provide information about average journey times by bike.

The CC group generally discussed more immediately experienced benefits associated with cycle commuting than the PCC group such as psychological wellbeing, relaxation, enjoyment of being outdoors and time and cost savings. Awareness of these immediate benefits may be more important than longer-term benefits (e.g. physical health) in promoting and maintaining cycling because behavioural decisions are more strongly influenced by immediate consequences (Gatersleben and Appleton, 2004). The present study found that the more immediate benefits associated with cycling to work were less recognised by potential cycle commuters. Although physical activity does not always confer emotional benefits (Backhouse *et al.*, 2007) the majority of cycle group participants in this study highlighted this as a benefit for them. Emphasising the immediate benefits and explaining the direct gains one can experience may encourage more people to start cycle commuting.

Being environmentally friendly was discussed by few participants and viewed as a peripheral benefit. This contradicts previous research that found the environmentally

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friendly factor to be an important benefit of cycle commuting (de Geus *et al.*, 2008). The contrasting findings could relate to the differences in personal values, beliefs and cultures between the participant groups. Another beneficial but peripheral factor for those who had young children was being a positive role model. Although these may not form the key reasons for choosing to cycle, peripheral benefits add weight to the decision to start cycling. Therefore, they should be viewed as valuable counterparts within the decision-making process.

Over half of the PCC group believed that starting to cycle commute would lead to increases in leisure cycling. For some people this increase in leisure cycling related purely to purchasing a bike but for others, starting to regularly cycle to work would be a catalyst to increasing their overall cycling behaviour. Promoting cycle commuting may therefore have wider benefits to people’s health (Wen *et al.*, 2005) and potentially their families too, through increasing leisure cycling.

Overcoming the Challenges

It is clear that cycling to work is a complex and effortful behaviour, and that numerous challenges need to be negotiated in order to cycle commute. The CC group described a range of coping strategies, to help them to overcome a number of challenging factors, such as: planning, preparation, mental strategies, developing a routine and learning ‘road craft’ (skills and confidence to cycle in traffic). Relatively little was said about such coping strategies by the PCC group, presumably because they were not yet familiar with such strategies that they could use to overcome the daily challenges of cycle commuting.

According to Mutrie *et al.* (2002), the use of effective coping strategies plays a role for people who successfully adopt active travel behaviours. Research into coping theory has received attention in performance sport (Nicholls *et al.*, 2005; Gould *et al.*, 1993a; 1993b) but has not yet been discussed in detail in the context of cycle commuting. The Transactional Process Theory of coping (Lazarus and Folkman, 1984) proposes two main categories of coping: problem-focussed coping and emotion-focussed coping. Problem focussed responses are associated with situations amenable to change; whereas emotion focussed responses are associated with situations not amenable to change. In this study the CC groups appeared to employ more problem-focussed coping strategies, (e.g. planning, problem solving and increasing efforts) than the PCC group. Potentially, problem-focussed coping strategies can be identified and developed through psychological interventions in a relatively short time period for a small cost. The coping strategies described by participants in this study could be easily incorporated into cycle commuting interventions. For instance: information about the use of panniers for carrying laptops, clear advice on how to deal with road traffic, suggestions on how to tackle lack of motivation, and tips on how to look presentable at work.

Preparatory plans and actions for initiating cycle commuting can also be understood as problem-focussed coping strategies that could help people considering cycle commuting to deal with uncertainties they may have about starting to cycle. In this study a number of the PCC group held uncertain or conflicting views towards aspects of cycling. According to Prochaska *et al.* (1994), individuals who are contemplating changing a particular behaviour are often in a state of ambivalence, which can prevent them from taking up a new behaviour. Plans and actions such as searching for

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information via the internet and by talking to peers, trying out prospective bike routes at quiet times, purchasing appropriate equipment and taking cycle training courses may all facilitate the transition from other modes of transport to cycling. Developing and carrying out such preparatory plans and actions could be capitalised upon in interventions by promoting the use of specific action plans and implementation intentions (Gollwitzer, 1999). These have proved successful in encouraging change in habitual stable travel behaviour such as commuting (Gardner, 2009).

As with previous studies, adequate cycle workplace facilities and social support at work for cycle commuting were seen as important for cycling to be a viable transport option (Cleary and McClintock, 2000; Wardman *et al.*, 2007). Workplaces should not only invest in cycle facilities but also ensure that they are user-friendly, accessible and known about by staff. Some PCC participants were deterred from cycling due to misconceptions about workplace facilities and lack of knowledge about cycle routes in the city. People who don't regularly cycle and do not view themselves as cyclists are more likely to overlook cycle related information in their environment. Targeted marketing and communications techniques could raise awareness of local cycling resources amongst potential cyclists.

It was commonly understood that improving the cycling infrastructure within the local environment is an important foundational requirement to overcome many of the safety concerns surrounding cycling. Similar suggestions have been made by previous studies (Cavill and Watkins, 2007; de Geus *et al.*, 2008; Wardman, *et al.*, 2007). However, infrastructure changes alone may not be sufficient to lead to behaviour change. Social Ecological Theories (e.g. Giles-Corti *et al.*, 2005) highlight the need to consider a

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3 complex range of diverse factors, including physical environment, social environmental
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5 and psychological variables that influence the up-take of cycle commuting and other
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7 forms of physical activity. Until the necessary infrastructure is created, cycle training
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9 courses are valuable resources that develop on-road cycling skills, safety and confidence
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11 towards road cycling.
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15 16 17 *Links to Theory and Intervention Implications* 18

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20 The present qualitative study was inductive by nature; however, the key findings parallel
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22 some of the main constructs found within social cognition theories. Within the
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24 Transtheoretical Model (TTM, Prochaska and DiClemente, 1982) and the Theory of
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26 Planned Behaviour (TPB, Ajzen, 1985), awareness of benefits and challenges mirrors the
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28 decisional balance (TTM) and the outcome expectancy (TPB) constructs. Coping
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30 strategies relate to the processes of change (TTM), self efficacy (TTM) and perceived
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32 behavioural control constructs (TPB). Indeed more social cognition theories could be
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34 mentioned in relation to the present findings as there is substantial convergence between
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36 constructs within numerous theories (Biddle and Mutrie, 2001). The present study
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38 indicates that in relation to cycle commuting taking a 'bottom up' inductive approach
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40 does not contradict a more 'top down' theoretical approach. Rather, understanding
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42 specific psychological factors that most closely relate to cycling can be valuable in
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44 identifying the most appropriate constructs, theories and techniques required to
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46 effectively promote cycle commuting.
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53 This study supports the view that psychological interventions designed to enhance
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55 understanding of the benefits of cycling to work, and develop more realistic perceptions
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of barriers to cycling commuting along with appropriate problem-focussed coping strategies are appropriate means of enhancing behaviour change. However, as previously acknowledged psychological approaches should be used in conjunction with other interventions including changes to the physical and social environments. This study demonstrates that even in cycle friendly workplaces, where physical and social changes have already been made, there is still scope to enhance rates of commute cycling through psychological intervention.

Strengths and Limitations

In the present study, more empirically generalisable and universal knowledge, which would involve larger sample groups, has been traded for an in-depth analysis. IPA, in the context of this study, proved to be a useful tool for revealing the full complexities of the psychological reasoning involved in choosing to commute cycle. This study employed a purposive sample of 15 participants, selected on the basis of them being either active cycle commuters or having an interest in cycle commuting. All participants worked at a single city centre site which had Cycle Friendly Employer status. The type of generalization that can be made here would be more analytical in nature, involving a reasoned judgement about the extent to which the findings from one study can be used as a guide to what might occur in another situation (Kvale, 2007). These findings are more likely to apply to individuals in similar settings in supportive cycle friendly environments. For example, in the current study participants did not discuss any security concerns which have been expressed by participants in studies based in other contexts (Cavill and Watkins, 2007). Future complementary research should be carried out on

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3 samples in different contexts to examine whether some of the findings that emerged
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5 within this study would be revealed in other populations.
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10 **Conclusions**

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12 This study describes the complexities of similarities and differences in perceived benefits,
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14 challenges and coping strategies of cycling to work between commute cyclists and
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16 potential commute cyclists. Potential cycle commuters perceived fewer immediate
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18 benefits of cycling and greater challenges. In contrast, commute cyclists described a
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20 range of coping strategies that counteracted these challenges and facilitated their cycling
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22 behaviour. Raising awareness amongst potential cycle commuters of the immediate
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24 benefits of cycle commuting and highlighting some of the coping strategies employed by
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26 existing cyclists may be useful in psychological interventions to promote cycle
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28 commuting.
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Table 1: Demographic information for commute cyclists (CC)

Pseudonym	Gender	Cycle commuting experience	Distance to work (one-way)	Age category
Andrew	Male	3-4 years	8 miles	31-40 years
Burt	Male	40+ years	4 miles	61-70 years
Carl	Male	2 months	3.5 miles	31-40 years
Dan	Male	4 years	5 miles	31-40 years
Ed	Male	2 years	3 miles	31-40 years
Fred	Male	14 years	9 miles	51-60 years
Guy	Male	5 years	2 miles	31-40 years
Helen	Female	8 years	2 miles	41-50 years

Table 2: Demographic information for potential commute cyclists (PCC)

Pseudonym	Gender	Commuting transport mode	Distance to work (one-way)	Age category
Amy	Female	Bus	5 miles	31-40 years
Belle	Female	Train	16 miles	31-40 years
Dawn	Female	Bus	2 miles	51-60 years
Euan	Male	Bus or walking	3 miles	31-40 years
Felix	Male	Walking	1.5 miles	21-30 years
Grant	Male	Bus or car	3 miles	21-30 years
Harry	Male	Bus and car	11 miles	41-50 years

For Peer Review

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